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THE DELTA PI EPSILON JOURNAL

A quarterly devoted to research, scholarship and leadership in business education

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The Journal invites contributions from business educators — members of the fraternity or non-members — from businessmen and women, and from educators in disciplines fundamental to progress in business education. Manuscripts should deal with the theory, practice and research in business education or fields related to it and should be addressed to the Editor.

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Electronics and Education In Accountancy[1]

IT IS MORE and more evident that the new managerial methods like electronic data processing imply nothing short of a new orientation to education for business. The accountant of the electronic age needs training not in "business arithmetic" but in logical process. His sphere of activity is no longer a restricted clerical area but an entire system, and his work often requires the skills of higher mathematics. An education that exercizes him in abstract and theoretical fields is imperative.

EDUCATIONAL FUNDAMENTALS

Among the educational fundamentals for future accountants in EDPM (Electronic Data Processing Machine) systems are:

1. Training in logical thinking
2. Acquaintance with accounting tools and equipment
3. Ability to apply flow chart techniques
4. Understanding of organizational structures and their relation to internal control of assets, revenues, and expenses
5. Practice in design of accounting systems
6. Conditioning for dealing with people

These are accounting fundamentals, superimposed upon the basic educational fundamentals of manipulative skill, economic understanding, effective communication, and cultural appreciation which are to be expected of all educated persons. The accountant of the future needs to know much more than procedures; he is concerned with entire systems rather than with narrow clerical functions. He must possess a point of view that is at once broad and detailed, general and specific, policy-oriented and operations-minded.

TRAINING IN LOGICAL PROCESSES

Probably the most basic requirement for the future accountant in industry or in public accounting is a background of conditioning in systematic thinking. With highly developed powers of analysis and synthesis, there is almost no technical problem in his area which he

[1]This material is taken in substantial measure from my book: Jones, Gardner M. *Electronics in Business*, East Lansing: Michigan State University, Bureau of Business and Economic Research, 1958, 106pp.

cannot solve. But the systematic thinker need not be restricted to acting in the field in which he received his particular vocational training. Specific trade skills are not transferable; the abilities of the analytical mind are.

Mathematical or symbolic training is one appropriate means of whetting the edge of intellectual ability. One's view of the "best" type of mathematical training probably is a matter of opinion conditioned by the conduct of the mathematical and math-related courses to which he has been exposed. It is the author's opinion that the type of mathematical training encountered in a typical "business mathematics" course usually taken by accounting students probably does less toward providing practice in logical, symbolic thinking than does basic general mathematics. The fault frequently lies not in the content of the course, but in the quality of teaching. Where the business mathematics course is offered within a business school, it is taught by people whose interests are not mathematical and who teach it only as an unavoidable assignment; where it is offered within a mathematics department, it is taught by people who are not at all business-oriented and who teach it only as an unavoidable assignment. (There are commendable exceptions, of course.)

Among students in business study areas which are word-oriented (non-quantitative), there is resistance to "hard" courses. College algebra, geometry, and the calculus are decried by business students as being too abstract, and by some accounting teachers as being impractical. Nevertheless, the practice in systematic reasoning processes and in visualizing and symbolizing intricate relationships between ideas is the same type of thinking organization that is needed in grasping the complexities of full-fledged, integrated data processing systems.

A useful bridge between mathematical fundamentals and practical business problems is the study of statistical method. The educational background of the accountant should provide a working acquaintance with regression and correlation techniques, sampling methods and sampling analysis, the use of statistical methods in control of production and of clerical output, and with other standard statistical devices for analysis of accounting, production, and marketing problems. His training should go further to encompass an acquaintance with (but not necessarily a working ability in) some of the more sophisticated methods of operations research.

The schools of business are becoming acutely aware of the criticisms of traditional education for business. An increasing volume of concern is heard from businessmen who are disillusioned with the mediocrity which is said to characterize the school's products. The

problem of achieving a balance between liberal education (preparation for living) and the acquisition of marketable skills (preparation for making a living) is extremely difficult to solve. American schools of business are struggling to find a solution. The faculties of the schools recognize the long-run imperative of social and cultural understanding by business managers; they know also that most young people must bring a specific ability to the marketplace to provide family income early in their business career.

There is widespread agreement that business education must be broadened, that there must be increased emphasis on the humanities, philosophy, and logical processes. The extent of the change in approach to education for business and the mechanics of the change are still to be determined.

THE USE OF ACCOUNTING TOOLS

In addition to conditioning in systematic thinking, the student needs to know the tools of his trade. The uses of various accounting devices should be taught, not as mechanics, but with emphasis on the managerial controls being built into accounting record systems. Moreover, it is necessary to understand traditional and mechanical systems in order to understand better the conversion to electronic systems.

The use of flow charting techniques to describe processes should begin with the first courses where accounting processes are described. The determination of net income, the position of a company, or movements of inventory can be described graphically as well as by schedule. The student gradually will develop through flow charting practice an ability to visualize in his mind as well as on paper even rather complicated accounting processes.

ORGANIZATIONAL STRUCTURE AND INTERNAL CONTROLS

An accountant's education should include the principles of effective organization, especially in relation to maintenance of internal control. He should have practice in setting up organizational charts for all kinds of businesses under various conditions, with the aim of developing workable administrative arrangements while at the same time maintaining accountability.

An important approach to the understanding of data transmission is the early incorporation of system design in the student's courses. In connection with the study of receivables, for instance, the organization of records for receivables and the possible alternative arrangements for processing charges and payments, and all other aspects of handling receivables might be considered as a unit for systems de-

sign practice. The student, as he goes along, could tie the receivables system into a larger system of accounts and of organization by its position in data-flow charts and organizational charts. Study of how to organize the flow of accounting information can be integrated with other accounting instruction. Accounting teachers could and should do much more experimentation along this line.

The study of accounting systems should include the generous use of cases from industry. While materials like the American Institute of Certified Public Accountants' Case Studies in Internal Control and other cases are available, instructors should assemble local case materials, wherever practicable, for student analysis and practice in criticism and construction of systems with an element of realism. In the study of electronic accounting systems, the analysis of actual cases is especially helpful, to present in concrete form the possibilities and difficulties in developing and using electronics for accounting work. Published case descriptions are limited (necessarily) in the detail that can be supplied and in the little problems that complicate system planning. It is for this reason that locally developed cases are most helpful.

CONDITIONING FOR DEALING WITH PEOPLE

Accounting students destined for either conventional or electronic accounting fields should receive, as a regular part of their training, instruction in courses which aid in understanding human nature. The accountant who is concerned with company-wide accounting systems, who is working with budgets, production, and financing plans, who must report both favorable and unfavorable performance, spends most of his time with people from all departments. He needs an understanding of the motivations that impel people to cooperate. Early in his college work, he should be introduced to the psychological and sociological areas, to help him attain that understanding.

UNDERSTANDING OF ECONOMIC FORCES

Accounting education already is generally understood to include, as an essential, basic training in economic principles. Accountants, engineers, and all other business and technical people cannot divorce their occupational activities from their performance as informed citizens. Few public performances are as out of place as that of an economically uninformed professional man speaking authoritatively on national economic questions; yet we see this happening almost daily. Knowledge of the roles of government and of business in the economy should be expected of every businessman and certainly of every professional accountant.

BASIC VERSUS TECHNICAL TRAINING

Whether students' vocational aim is public or industrial accounting, a thorough background in logical thinking, systems analysis, and accounting theory, with secondary emphasis on clerical tools, will go a long way toward giving students a proper educational background for the eventual assumption of top-level accounting responsibility.

Few universities have provided specific instruction in computer systems for business students, although industry is increasingly interested in hiring young men with some acquaintance with the subject. Computer training, while economically valuable to the student, is an *adjunct to, not a substitute for,* regular accounting instruction. There is no substitute for fundamentals. Colleges could conceivably do a disservice to students by allowing substitution of technical specialties for a fundamental understanding of how business (not accounting alone) is carried on; nor would society be well served by allowing students to remain ignorant of the ethical and social implications of their business actions.

INTERNSHIPS

Accounting and industrial firms in some parts of the country offer periods of practice to accounting students. Industry can provide a useful service to education (and indirectly to industry itself) by providing similar internships within commercial data-processing systems. As has been demonstrated repeatedly, internship experience in industry complements classroom work, giving to students a heightened sense of reality in their studies. The growth of internship programs in industrial accounting for students has been slow and even today is not really extensive. It would be mutually beneficial for the colleges and industry to develop internship programs in data-processing.

NON-COLLEGE TRAINING PROGRAMS

Industry is the chief beneficiary of an investment in technical education. The primary responsibility for the educational development of industrial employees along technical lines should fall on industry itself. Is it not a corporate responsibility to make the best use of employee abilities?

However, outside of the industrial corporation there are large numbers of business people who are not part of any large organization having a formal training program. Members of smaller public accounting firms, bank employees, and others have vocational need for some training in business electronics; others desire merely to upgrade their own level of knowledge. The colleges have a responsi-

bility to this unorganized public; courses should be available to meet their needs. Where enrollments will justify, adult education programs should include work in the computer area to the extent the business community requires. This should be a joint activity of the colleges, local schools, the machine manufacturers, and the several users of equipment on a local basis. As more and more businesses become involved in EDP, we probably will find appropriate offerings in the community colleges, first in the punched-card system area and then in electronic systems.

PROFESSIONAL EXAMINATIONS

The uniform examinations given to prospective Certified Public Accountants do not at present include questions directly involving accounting systems. No projection is ventured as to when the examinations will reflect the influence of electronic account systems; probably there will be no specific questions based on electronic systems until the devices come into such broad use that at least a little understanding of them is considered reasonably necessary as a prerequisite to certification. However, the increasing reliance being placed on the outside accountant as a consultant, not just as an auditor or tax specialist, seems to indicate that the accountant needs to be qualified as an authority on accounting systems. The uniform examination probably will begin to include questions of a systems nature, to test candidates' qualifications in this area.

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(EDITOR'S NOTE: The author suggests that the "neophyte no longer hunt here and there to make his acquaintance with these new systems; any of the recent books will serve as a good beginning point for the interested business reader".)

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KAREN R. GILLESPIE

Specialized or General Education for Potential Retailing Executives?

COLLEGES, WITH THE COOPERATION of retailing establishments, began four decades ago to prepare young aspirants to become retailing executives. Thousands of young men and women have received some college education in retailing subjects throughout the intervening years. According to the viewpoints of those executives who hire and promote potential executives, how desirable is such specialized higher education in retailing in preparing young people for positions in the merchandising and/or management divisions of large retailing organizations?

An executive, for the purposes of this report, is defined as ". . . a person holding a position of responsibility, or one having supervision over the work of others." (see Reyburn, 1933)

If retail stores are better to serve the public, those stores need capable executives. It has been said of the need for executive ability (see Cleeton and Mason 1946)

> "Roughly ten percent (sic) of employed persons in the United States, or approximately five million individuals, are engaged in work of an executive nature. In many ways this is the most important 10% (sic) of those employed, for upon their skill and ability as managers depends the effectiveness of the remaining 90% (sic).
>
> . . . . . .
>
> Mismanagement results in social waste. Since the need for executive ability exists, its discovery and development are highly important, and a more general recognition of the importance of the question is a social problem of prime significance."

Knowledge of how capable executives are developed necessitates reliable data on the relationship of education to executive development. Although retailers hire graduates from high school distributive education programs and majors in retailing from junior college and four-year college programs, these same retailers have not made the study of retailing a prerequisite to employment. Many recruit as readily in liberal arts colleges that provide no retailing education as they do in specialized schools of retailing. If people with no retail-

ing education are as capable as those with retailing education, what are the studies that provide the kinds of background, abilities, personality characteristics, and skills that the retailer seeks?

If school administrators and faculty members are to plan programs of study that will most effectively prepare young people for executive careers in the retailing field, they need to know more about the educational needs and demands of those executive positions. Teachers and college counselors can use such information also to provide helpful vocational guidance for students interested in executive retailing careers.

EXECUTIVES RECOMMEND EDUCATION LIKE THEIR OWN

For a research study at Columbia University, (see Gillespie, 1959) the sample was composed of ten New York City retailing organizations, employing a minimum of 1,000 persons each. The firms included: three chain organizations, three department stores, and four specialty stores. These mercantile establishments are representatives of the large emporiums to be found throughout the country. They are also representative of the kinds of organizations that seek young people for executive careers and to which young people, seeking such careers, apply.

Three executives from each of the ten organizations were selected for interview: (1) the personnel executive primarily responsible for the hiring of potential executives, (2) a merchandise division top executive, and (3) a management division top executive. These executives were responsible for guiding the destinies of ten to hundreds of lesser executives within these organizations.

In seeking to determine what education these thirty executives believed best prepared a potential executive for a career in retailing, each was asked what broad fields or areas of education he would suggest to young retailing aspirants who were planning to attend college. Their replies indicated that:

11 executives particularly recommended liberal arts.
8 executives particularly recommended business administration.
2 executives particularly recommended retailing.
7 executives considered two or more fields equally desirable. (These included liberal arts, business administration, retailing, home economics and/or engineering.)
2 executives had no preference for any field of study.

LIBERAL ARTS RECOMMENDATIONS

That the executives tended to recommend the education with which each was most familiar was evident from their replies. Ten

of the eleven executives who recommended liberal arts study for potential retailing executives were themselves graduates of liberal arts colleges. The eleventh executive was a graduate from a school of education.

The comments the executives made in support of the desirability of liberal arts education for potential retailing executives included the following:

> "The president's point of view, reflected through the store, is for well-rounded people, and liberal arts training is best as a base."
>
> "We find liberal arts men to have some tremendous balance. A working knowledge of the arts, philosophy, logic, rhetoric can apply to business."
>
> "Once in business, it is hard to acquire a background. We can teach the technicalities of the business. If they select straight business courses, they should do so after liberal arts. I strongly recommend liberal arts for a broad, cultural background. They should take psychology, philosophy, fine arts, English, and history, particularly."

BUSINESS ADMINISTRATION RECOMMENDATIONS

Of the eight executives who particularly recommended education in business administration three had business administration degrees from college, and the other five had taken business administration courses but had not completed their degrees. Again, the tendency to recommend the field of study with which each was familiar was apparent.

The following comment in support of the importance of business administration study as background for retailing was made by one executive:

> "I . . . particularly look for business administration courses. If they (applicants) have not taken business courses, I ask, 'Why?' when they are now interested in entering retailing."

RETAILING RECOMMENDATIONS

Neither of the two executives who particularly recommended specialized retailing education had taken retailing courses in college. These executives' comments pertaining to the importance of retailing study for potential executives were:

> "Retailing education should be first because it indicates this is the person's primary interest."
>
> "Retailing study makes an applicant attractive to us – it proves his basic interest in the field."

RECOMMENDED COURSES VARY WIDELY

When the executives were asked to rate actual courses or course-areas, an emphasis was revealed that was somewhat different than they had previously expressed about preferable fields of education. A series of 86 courses or course-areas, representing courses commonly taught in the various fields, was selected for rating (See Table I). Of these, 39 were liberal arts courses, 22 were business administration courses, 20 were retailing courses, 11 were home economics courses, and 7 were business education courses. (The total comes to more than 86 courses since some, such as statistics, research, economics, and fashion, are taught in more than one field).

The executives were asked to rate each of these 86 courses as: "Essential for study", "Desirable for study", or "Of Little Value" for potential retailing executives. *No course or course-area was selected by all thirty executives as either essential or desirable. Seven courses, however, were selected by 50 per cent or more of the executives as essential.* These were: Human Relations, Human Relations in Retailing, Human Relations in Business, Speech, Business English, English Composition, and Economics.

THE IMPORTANCE OF THE HUMAN RELATIONS COURSES

Three courses, (Human Relations, Human Relations in Business, and Human Relations in Retailing) designed specifically to provide for the development of students in working with other people, were listed among the 86 courses. All three of these human relations courses were chosen as essential by two thirds or more of the executives. By their endorsement of these three courses, the executives indicated an approval of the trend in education toward cutting across fields of knowledge to bring related areas of study together into "core" courses. Human relations courses, whether taught in liberal arts, business administration, or retailing departments, deal with data resulting from studies in psychology, sociology, and anthropology. These latter courses, however, were rated essential by only eight, three, and two executives, respectively. The student could amass human relations knowledge in those various courses and then translate and adapt these learnings to the work to be done in stores. However, the executives appeared, by their ratings, to consider a core course, which interweaves such knowledge and which applies the learnings to everyday situations in dealing with people, to have greater value for prospective retailers.

THE IMPORTANCE OF COMMUNICATION COURSES

Second only in importance to the human relations courses, according to the ratings, were the courses concerned with oral and written

TABLE I

How Retailing Executives Rate the Value of College Courses

COURSE N = 30	ESSENTIAL	DESIRABLE	RANK[1]
**Human Relations, **_Human Relations in Retailing_	21	7	1.5
**Human Relations in Business	20	9	3
**Speech	17	8	4
**Business English, **English Composition	16	12-11	5-6
**Economics	15	14	7
*_Retail Personnel Adm._, *Retail Salesmanship, *Retail Management	13	15-11	9-13
*Marketing	12	14	14
*_Retail Buying_	10	15	15
*Accounting, *Math., *Lit., *Pych., *Sales Promotion	8	20-11	16-20
*Industrial Relations, *Financial Management, *Personnel Management, *Fine Arts	7	18-12	21-24
*Philosophy, *Textiles for Consumers	6	14-12	25-26
*_Retail Advertising_, *Business Law, *_Color and Design_, *_Retail Research_, *_Introduction to Retailing_, *Advertising, *Algebra	5	20-12	29-33
*_Fashion_, *Finance, *_Chain Store Mgt._, *Clothing Construction, Physical Education	4	21-10	34-38
*Display, *Statistics, *Bookkeeping, *Clothing Selection, *Retail Textiles, *Consumer Non-Textiles, Education, Sociology, _Textile Testing_, Typing	3	21-10	39-48
*Research, *Transportation, *_Copywriting_, *History, French, Religion, Anthropology	2	18-3	49-55
*_Interior Decorating_, *Non-Textiles, Banking, Foreign Trade, Home Ec., Dramatic Arts, Geography, Architecture, Latin, Music, German and others	1	19-1	56-67
Government, Geometry, Insurance, Law Calculus, Journalism, Stenography, Chemistry, Real Estate, Physics, Spanish, Natural Sciences and others	0	13-0	68-86

**Courses rated essential by 50 per cent or more executives.

*Courses rated at least desirable by 50 per cent or more executives.

[1]Rank determined by essential ratings as modified by desirable ratings.
(Retailing courses appear in italics)

communication: Speech, Business English, and English Composition. The executives, by these ratings, indicated their interest in the ability of their potential executives to express themselves capably both orally and in writing. The need for improved communication in expanding retailing organizations and the increasing demands for executives to "sell ideas" to employees, vendors, other retailers, and customers were reflected in the ratings of these communication courses.

THE IMPORTANCE OF ECONOMICS COURSES

The selection of economics as an essential subject for study by just one-half of the executives indicated the executives' concerns that neophyte executives have a broad concept of the production, distribution, and consumption of material wealth.

INTEREST IN LIBERAL ARTS COURSES

Over one third of the executives interviewed stated that they preferred liberal arts as a field of study for young people preparing for retailing careers and an additional five executives considered liberal arts as desirable as any other field of study. However, in their actual ratings of individual courses, 50 per cent or more of the executives rated but four liberal arts courses as essential: Human Relations, Speech, English Composition, and Economics. Only nine additional liberal arts courses were recommended by at least one half of the executives as being desirable for study: Mathematics, Psychology, Literature, Fine Arts, Philosophy, Algebra, Statistics, Research, and History.

INTEREST IN BUSINESS ADMINISTRATION COURSES

Of the thirty executives interviewed, eight recommended business administration as the most important field of study for potential retailing executives, and an additional five executives considered this field to be as important as any other for study. Three business administration courses were selected as essential by at least one half of the executives interviewed: Human Relations in Business, Business English, and Economics. The latter course is usually available in both liberal arts and business administration programs.

In addition to the three courses listed above, one half or more of the executives rated 14 additional business administration courses as being at least desirable for study by potential retailing executives. Those with the highest ratings were: Salesmanship (General), Management, Marketing, and Accounting.

INTEREST IN RETAILING COURSES

Just two executives particularly recommended retailing as a desirable field of study for potential executives while five others stated

that it was equally as desirable as other fields of study. The only specialized retailing course that was selected by 50 per cent or more of the executives as essential for study was Human Relations in Retailing. *However, more retailing courses were selected by 50 per cent or more of the executives interviewed as being at least desirable for study than were those of any other field.* Eighteen courses in addition to the one mentioned above were so rated.

INTEREST IN HOME ECONOMICS AND BUSINESS EDUCATION COURSES

Courses in home economics and business education that might be selected by potential retailing executives were also included for rating. None of these courses was rated as essential by 50 per cent or more of the executives. However, seven of the eleven home economics courses listed were rated by one half or more of the executives as being at least desirable for study: Textiles for Consumers, Color and Design, Fashion, Clothing Construction, Clothing Selection, Non-Textiles for Consumers, and Interior Decoration.

SPECIALIZED AND GENERAL EDUCATION NEEDED

For educators who have been assailed during the past years with debates over the relative merits of specialized education versus general education, the implication of these ratings appears to indicate that retailing executives consider that both kinds of education are desirable for potential executives and emphasis might be almost evenly divided between them.

Colleges and universities offering standard programs of study in business administration and/or retailing toward undergraduate degrees usually include general education courses in their required curriculums. Usually, a minimum of 40 per cent to a maximum of 60 per cent of the curriculum is taken in such general studies. If these studies include those areas considered essential by the majority of the executives interviewed, combined specialized and general studies programs would appear to be desirable for potential retailing executives. Students enrolled in liberal arts programs, however, rarely have an opportunity to select a substantial number of specialized business courses.

Unfortunately, many young people have not made their career plans while they are in college. Until they have determined their career interests, little can be done, except through general education, to prepare them adequately to enter any field of endeavor.

These conclusions only serve to reiterate those advocated by a national commission (see President's Commission on Higher Education, 1948)

"To have some insight into the values and standards that

men have found good in governing their lives, to be able to communicate ideas clearly, to possess the ability to deal with people in a friendly and considerate manner – these, more commonly than we think, perhaps, are the elements of vocational competence."

A PROPOSAL FOR FUTURE PROGRESS

The primary purpose of collegiate schools and departments of retailing is to prepare young men and women for executive positions in the retailing organizations of the future. Most retailing departments require that their faculty members be recruited from among those who have had retailing executive experience. But is that enough to keep the curriculum meeting the challenge of a constantly changing field such as retailing? Education to prepare future leaders for this dynamic field needs to be reappraised constantly to assure its worth in meeting requirements for these potential executives. Therefore, periodic opportunities for faculty members to exchange information with top retailing executives are desirable.

Personnel executives who hire graduates are frequently contacted by retailing educators. Merchandising and management executives have important roles to play in the training and promotion of large numbers of young people so their opinions should also be sought by educators planning curriculum changes. By using executives' opinions such as those expressed in this study, retailing educators might wish to replan the retailing courses in their curriculums to include increased emphases on the development of leadership qualities and verbal skills.

In additional to effecting changes in the curriculum, educators, through their contacts, might awaken these top executives to the contributions the specialized college courses are making to the retailing executives of the future!

KAREN R. GILLESPIE is an Associate Professor at the New York University School of Retailing. She is a former buyer and training director at Abraham & Straus, Inc., and is the author of two texts, *Know Your Merchandise* and *Home Furnishings.*

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LAWRENCE M. STOLUROW

The Psychology of Skills[1]

Part II: "Analysis and Implications"

IN THIS PAPER the fabric of skills will be examined in a manner analogous to the biological examination of a tissue under a microscope. Unlike the microscopic structure of a tissue, the grain of a complex skill becomes apparent through the aid of theoretical concepts such as those presented in the first of these two papers (Stolurow, 1959). The purpose of this analysis is twofold: (a) to provide a base for understanding psychologically some of the complexities of human skills, and (b) to extract useful implications for teaching.

MOTIVATION AND LEARNING

To analyze skills it is necessary to tease out of the gross, observable features of behavior, the separate component processes that are its underpinnings. A basic distinction at this level is between the associative processes (those that establish connections or linkages between the stimuli and the responses of the task to be learned) and the non-associative processes. Motivation is, for example, one of the more important non-associative processes which nevertheless interacts rather directly with associative processes. Motives, incentives, reinforcements, and learning are almost inextricably intertwined and the separation of their meaning is correspondingly difficult. Contributing to this difficulty is the fact that while motivation is a necessary condition of the learning process, many motives are themselves the product of learning. Similarly, objects acquire incentive value and/or reinforcement value. Thus many objects have two functions. As incentives (e.g., money) they are motive producers (we work to earn it) and as reinforcers they are motive reducers (e.g., have enough money; will stop work and retire). Anticipated objects are incentives. Objects in hand are reinforcements.

[1] This is the second of two papers adapted from a presentation at the Sixth Annual Summer Business Education Conference, Department of Business Education, College of Commerce and Business Administration, University of Illinois, Urbana, Illinois, July, 1958. The author would like to express his gratitude to Dr. L. J. West for many helpful suggestions.

Much of the adult motivation which is important in learning new skills is learned motivation. Some general motives develop as a result of the continued successes achieved in learning. In other words, over and above the skill learned, the success experienced in learning contributes to the desire to learn, the desire to achieve. Once developed, these motives have widespread applicability and provide a mechanism for continued achievement. Consequently, they can be described as a "built-in" mechanism for learning, for once acquired, each becomes an automatic by-product of every new task that the learner attempts.

To the extent that a skill is imbedded in a context of valued objects it can be said to have *intrinsic motivation*. When motivation is of this type, it is most effective for learning. It can be contrasted with motivation related to the goal or reward but not attached to the skill being learned. The latter is *extrinsic* motivation. Sometimes it is necessary to use external incentives to get the student to learn and it is possible for some of the value of the external incentive to transfer to the skill itself. Thus, the child may learn to ride a bicycle because of the candy or money offered him, but as a result of the initial learning, he may nevertheless find intrinsic reward in riding which keeps him at it. Similarly, in learning to play a piano or other musical instrument, once the child has attained a modicum of success – provided it has been achieved under a positive, not negative (e.g., fear) drive – he is likely to find intrinsic rewards which keep him practicing.

By making relatively small steps in skill learning at first and gradually adjusting them to the developing capability of the learner – many subgoals, rather than a single terminal goal – the learner's successes can be multiplied. In this way his opportunities to develop a generalized desire to achieve through a background of successes becomes increased.

The individual experiences of learners not only produce wide differences in the relative value of specific objects to them, but also in the relative value of learning specific skills. The specific context within which a basic skill is taught can have very significant effects on the learner's motivation. For example, learning to type a business letter may have high incentive value to the student who wants to be a secretary but low incentive value to the liberal arts student who wants to learn to type technical reports. Similarly, statistical skills also have general applicability in the analysis of data from such diverse fields as economics, engineering, psychology, and sociology, but there are nevertheless separate texts and courses all designed to teach these same basic methods to different interest

groups. Each course varies from the other in the problems used in teaching the basic methods. Motivationally this is sound procedure. It permits the teacher to introduce intrinsic motivation.

VERBAL INSTRUCTIONS

The instructions given the learner not only provide information, but almost motivation. Not all learners will respond in the same way to verbal instructions. There are wide individual differences in reactions to the appeal of achievement; that is, some children do not care about school and may not respond to the usual reasons for achieving that are advanced by teachers. Nevertheless, instructions should be positive because learning under the control of reward and positive motivation is generally better than learning under the control of punishment. Instructions should emphasize positive goals and define specific incentives wherever this is possible. They should not stress the consequences of failure.

RIVALRY

Fortunately, research findings indicate that relatively high motivation and correspondingly important effects on performance can be produced by rivalry. Rivalry can be produced in several ways. For example, by competition with one's own previous performance; by competition with someone else; or by competition of one group with another – group rivalry.

The general finding seems to be that group rivalry is less effective than individual rivalry. With individual rivalry, it has been found that a person told that he has performed less well than his competitor (regardless of how well he really performed) tends to drop in performance, not only on the task used in making the comparison, but also on a subsequent task. Since under this condition one member of a pair is bound to fail, this factor will have an adverse effect on the performance of half of any group. Therefore, unless extremely close matching is possible, it is to be avoided as a general classroom procedure. On the other hand, competition with one's previous record coupled with guidance in the anticipation of the next level to be striven for is not fraught with this difficulty. Thus the teacher's choices are to offer specific (or concrete) rewards, to build in competition of the learner with his previous performance, or to use both.

APPROACH-AVOIDANCE CONFLICT

The previous history of successes and failures in learning skills results in a generalized disposition or motivation state that becomes aroused as one approaches a new learning task. Therefore, self-

confidence or its counterpart, the fear of failure, can become attached to the beginning of new activities. As a student is introduced to a new task, he may prepare either for withdrawal or for anticipation – for approach or avoidance. Which of these dispositions will be aroused depends upon similarities between the impending situation as the learner perceives it and related experiences in his past. The disposition to withdraw can interfere in a basic way with the performance of a new task. On the other hand, the disposition to approach the new task can facilitate the learning of the new task. However, approach and avoidance tendencies sometimes exist side by side and produce conflict.

Examination of the way in which these dispositions can interact within the same person can reveal some important effects of motivation on the learning of new skills and some factors to be considered by the teacher in manipulating conditions of motivation for the learner.

A half-hearted performance is one in which the actual disposition to withdraw is mixed with the disposition to approach the new task. Consider, for example, the graduate student who is urged to take statistics as an indispensable research tool, but who has always feared math. It is common experience that these two conflicting dispositions can and do interact with one another. They are competing sets of responses within the learner and produce approach-avoidance conflict. Under such conflict, the tendency to approach is greater so long as the individual is at a safe distance from the task, but avoidance tendencies become stronger as the threatening task comes closer (Dollard and Miller, 1950).

How does the teacher deal with this conflict as it may exist either before actual engagement in the task or after the task is undertaken? A personal experience may illustrate the underlying mechanisms and the steps available to the teacher for resolving the conflict. During World War II my typist talked about wanting to be a stenographer but did nothing about it. Several years earlier she had had a course in shorthand and often doodled in shorthand but refused to take dictation. A family tragedy occurred requiring her to contribute financially to the family's support. This increased her motivation to earn more money. Capitalizing on this situation, she was encouraged to take dictation so as to become a stenographer. She consented, whereas she had previously refused.

In this instance the increase in motivation which made approach tendencies dominant over the previously stronger avoidance tendencies arose from a development outside the working situation. Nevertheless, the point illustrated is that one way the teacher can

enhance approach tendencies is to increase the motivation in the desired direction. It is important to recognize, however, that motivation which is too intense (involving fear or pain of anxiety) may be accompanied by distracting emotional states and thereby may be less effective than moderate motivation.

For some persons, conflict may precede actual experience with the new task; for others, it may occur at the first sign of failure; and for still others, after a few failures. This is why it is especially important in conflict situations to insure early success. Through the deliberate use of simple dictation materials – brief correspondence using common words – my budding stenographer experienced many successes, and the approach-avoidance conflict was gradually reduced. If the working situation had been punitive, so that slowness and inaccuracy were severely criticized, avoidance tendencies would have increased. These, coupled with the approach tendencies generated by the need for more money, would have resulted in a more severe conflict. With the tolerant and encouraging atmosphere of her early stenographic efforts tending to lower her avoidance tendencies, a need for still more money would have increased her approach tendencies and might have brought her to the point of asking to be given dictation of her own accord – the problem thus tending to eliminate itself.

Conflict can be produced by the task itself, as: (1) when the individual's capacity is low with respect to the demands of the task, (2) when the task involves difficult discriminations, or (3) when it requires a variety of different responses to rapidly varying cues. In such situations, in addition to moderate rather than intense motivation, it will help to simplify the task by using: (1) simpler materials, or (2) a slower pace (for very young or for less able learners), or (3) initially lower standards, or (4) some combination of the foregoing. Since learning motivated by success is preferable to learning motivated by failure, it would be better to err on the side of oversimplification. No method of instruction should, however, penalize the average or more able students by holding them back and impeding their progress.

FATIGUE

Many consider fatigue to be only a negative factor in its effect on learning. If kept within limits, however, fatigue resulting from continuous practice can be a positive factor. It can serve to eliminate unnecessary responses. Fatigue is a gradual process which has both motivational and physiological implications. It can selectively affect individual components of the skill being practiced. It is not

an all-or-none affair that suddenly appears and knocks out total performance. Fatigue develops gradually and by degrees.

Everyone is familiar with the experience of being tired and having his responses become less extensive or less vigorous than they were when he was fresh and not tired. This experience illustrates the process of fatigue in a way in which it operates to eliminate components of a total performance. Some of the responses which you are too tired to make are not necessary in the first place. Thus, their elimination actually improves performance. (For an extreme example, consider the Western method of horse breaking, in which the bucking horse is ridden into a state of utter exhaustion and docility, at which point it becomes amenable to specific training.)

On the other hand, if fatigue becomes too high, it interferes with the accomplishment of the goal. In other words, although fatigue can serve to eliminate unnecessary responses, it also can select out the significant responses and prevent the achievement of the goal. Consequently, there is a problem of keeping it within limits. That it will not always eliminate unnecessary responses is illustrated by the finding that even after a life-long occupation as a bricklayer, most artisans have preserved to a surprising extent some bad methods and unnecessary motions. An analysis of experienced secretarial workers would undoubtedly reveal that the same thing was true for them. This illustrates that without a deliberate attempt to eliminate unnecessary responses, the responses may persist in spite of selective elimination of some through fatigue.

Many possible reasons could account for this persistence. One is that responses become strongly associated with one another in one context, even though in another context, only one of them is required, for example, the child who reads aloud even though there is no one present. The habit of moving the throat and mouth muscles required in articulating the words that are read has become strongly associated with looking at the words on the page. In fact, the association of one response—reading—is associated with another—speaking aloud—to such a great extent that the child must deliberately learn to eliminate the speaking responses when he wishes to read to himself. Pressing the child to read after her speech is fatigued is one way of eliminating this connection. Similarly, the beginning typist reads the printed material that she is typing and it elicits meaningful associations or responses, quite often vocal ones. As she becomes more proficient later on, the typing becomes more automatic and the intellectual and speech-like responses drop out. The experienced typist will often be unaware of the content of the material just typed. Thus, the intervening responses usually associated with read-

ing in other situations become eliminated in order to achieve high speed. These unnecessary habits can be eliminated also by increasing speed in a deliberate way – using deadlines for task completion or setting higher speed goals. Natural fatigue will contribute to some extent to the dropping out of responses, but usually it is necessary to assist the process.

The instructor's task is to watch for those fatiguing signs which are significant as well as to sensitize the learner to them. That is, the learner should be allowed to stop work for a few moments when he feels fatigued. The teacher should permit as much practice as the learner can tolerate without negative modification of the action system required to achieve the goal. With experience the teacher should be able to detect fatigue signs before they are sufficiently great to produce deleterious modifications of skill.

IMPLICATIONS FOR TEACHING

A motivated learner will acquire a skill more rapidly than a less motivated one. Active participation by the learner will keep motivation at a higher level than will passive reception (compare, for example, question and answer techniques to straight lecture). Excessive motivation can, however, lead to interfering responses, especially in conflict situations in which the learner is torn between approach and avoidance. This may seldom be the case with typewriting, toward which initial attitudes may be more favorable than for most other school subjects. However, cultural pressures rather than intrinsic interest perhaps turn many young women toward shorthand. To whatever extent the symbolic systems of shorthand are reputed to be "hard" or to require a lot of work, sensitivity by the teacher toward approach-avoidance conflict and skill in reducing it are needful.

Moderate amounts of tension promote learning, but excessive amounts may interfere with making the required responses to the task. If the task is simple relative to the ability of the learner, an anxious learner will perform better than a non-anxious one. However, if the task's complexity or difficulty exceeds the learner's capacity, non-anxious persons will do better.

Reward is typically better than punishment, and the experience of success is an excellent reward. Because tolerance for failure is best learned as a result of a long history of previous successes, the learner can be prepared for more difficult parts of a skill by providing him with a backlog of successes. The learner's experiences of success and failure generalize not only to other skills, but also to teachers. The personal history of the learner with respect to author-

ity figures may hamper or enhance his ability to learn from a given teacher.

The effectiveness of simple praise as a reward depends on the learner's previous history. It is most effective for those with a past history of deprivation in this regard. However, reproof is sometimes more effective for those with a long history of success and praise who are not now working to capacity.

Interspersing practice intervals with frequent short rests ("spaced" practice) tends to keep motivation and, accordingly, performance at a higher level than does massed practice. The need for rest is almost always underestimated by those who are unaware of the experimental evidence. Moderate amounts of fatigue can, however, be useful in shaping behavior by contributing to the dropping away of unnecessary responses. On the other hand the teacher must be alert to excessive fatigue and to the fact that motivation does not always remain at a constant level during practice.

All the foregoing considerations notwithstanding, the primary means of shaping responses is through selective reinforcement, through furnishing the learner with knowledge of results. Consistent, 100 per cent reinforcement promotes the fastest *learning*. While inconsistent or aperiodic reinforcement makes for greater resistance to *forgetting*, uniform reinforcement is probably desirable, especially during the early learning stages, for skills which tend to be overlearned (e.g., straight copy typing).

The most critical factor in using reinforcement is timing. Reinforcement, regardless of type or amount, should immediately follow response. In reinforcing responses through knowledge of results, particular attention should be given also to the informational aspects of error information. Knowing that a response is wrong when only two alternatives exist is more informative than when more exist. The more precise the knowledge of performance, the faster the learning. Informing the learner of the consequences of his behavior aids him in discovering and fixing the correct response and tends to maintain his motivation.

SKILL DEVELOPMENT

A skill is not a static phenomenon. It is a dynamic, changing affair. Changes take place in many aspects of a skill as well as in the supporting, non-associative processes just described. One way of conceptualizing skill modification is in terms of three major categories of change: (1) stimulus, (2) response, and (3) linkage pattern.

STIMULUS MODIFICATION

Perceptual skills play an important role in tasks in which the use of language is a component, e.g., shorthand, typing. In learning to read, for example, it is necessary to be able to distinguish letters. However, progress in reading is dependent upon the development of skills using larger perceptual units – patterns of letters, phrases, etc. One way in which learners can achieve this more molar level of cue-stimulus development is through the integration of perceptual and response-produced cues. The responses learned at the "letter stage" are themselves cue producers. In exactly the same fashion, while the letter level of skill in typing is highly dependent upon external cues (print marks on paper), the later stages – ones in which the feel of one motion serves as a cue for the next motion – involve an amalgam of external and response-produced cues. This process is probably best facilitated by having the beginner look at the keys while making responses. Such a procedure would have three additional advantages: (1) it would provide the closest contiguity of stimulus (sight or hearing of letter) and response, (2) it would furnish the learner with immediate reinforcement, and (3) it would facilitate making ballistic motions. For these reasons touch typing should not be used at the start even though it is the eventual condition to be used.

RESPONSE MODIFICATION

Just as the stimuli grow more complex and come to depend on internal as well as on external cues as skill advances, so do responses. In fact, in typing the variations in response sequences are probably the principal source of difficulty. Each word or sequence presents a requirement for serial learning, for linking series of motions in small chains. Each particular word requires the learner to make an invariant series of ballistic motions. However, while the sequence required for a word is invariant, each response within the sequence also is a component of other response sequences. That is, each letter can occur in conjunction with many other letters in various words. It is this overlapping membership in many different sequences that generates the difficulty in acquiring higher-order stroking habits.

In addition, the length of the sequence that may be stroked in serial fashion has a built-in limit rarely exceeding, even for the most expert typists, a few letters (West, 1958). This limitation arises from the very fact of variety in the letter sequences in the language. For example, consider the sequence *ea*. It may be built up to *ear* in words like *early*, *earth*, *earn*. But note that in these instances the fourth stroke differs. Thousands of similar illustrations could be of-

fered to document the fact that two or three and just occasionally four or five letters represent the limit of stability for sequences in the English language. This is exactly what limits higher-order stroking habits to sequences that rarely exceed just a few letters. In a language with longer stable sequences than English has, longer skill sequences could potentially be built up. In English, the combinations are variable even for only two letters (except for *qu*).

Because it is sequence typing that defines higher-order habits, it is important to avoid practice on sequences that do not exist in the language: sx, jm, fv, etc. In view of the probabilistic nature of letter sequences (i.e., the commoner ones have a greater probability of occurrence) and of the need to restrain response tendencies toward non-occurring letter sequences, word and sentence materials can do at least two things that nonsense drill materials cannot do for teaching typing. First, they allow the learner to build up higher-order probability patterns of stroking responses – corresponding to letter sequences in the language (West, 1956). Second, they allow the learner to eliminate response sequences that never occur.

ASSOCIATION OR LINKAGE VARIABILITY

One determinant of the optimum materials and procedures for training in any given task is the nature of the associations involved. Some tasks involve one-to-one relationships (Washington, D. C. is the capital of the United States; at sea level water boils at 212° Fahrenheit). Some tasks, like reading, involve mainly many-to-one or convergent relationships (*sion, tion, cian* = *shun*), in which the variability lies chiefly in the stimuli, the pronouncing response being stable. Other tasks, such as spelling, often involve one-to-many or divergent relationships (identical pronunciation but different spelling in *to, too, two*), in which the variability lies chiefly in the responses. Spelling is notoriously harder to master than reading, and this simply illustrates the general finding that convergent relationships tend to be more easily mastered than divergent relationships. To put it another way, tasks in which the same response is made to a number of stimuli are learned faster than those in which different responses must be made to the same stimulus. For example, there is little problem in Gregg shorthand in learning to write the same outline for *to, too,* and *two;* but there is something of a problem in learning when to represent the prefixes *con* and *com* by *k* rather than by *k-n* and *k-m* (compare the outline for *contract* with those for *connect, comrade, committee*).

Still another consideration, particularly applicable to stenographic training, arises when reversible connections have to be learned in

both directions. In taking dictation, the stimulus is a sound and the response is a shorthand outline. In reading shorthand, the stimulus is an outline and the response is a sound. In transcribing, responses consist of (type)written series of English letters. Research had indicated that learning associations in one direction does not necessarily result in their being learned in the opposite direction (Stolurow and Bergum, 1958; Stolurow, Detambel, Newman, 1956). Additional or special practice is required to bring the associations up to the same strength in both directions. Variations in the quality of outlines from dictation session to dictation session – as the speed of the dictation and the level of skill of the writer may vary – mean that the stimuli during transcription will vary. This suggests that plentiful practice in reading from one's own notes will tend to be more useful than reading of plate shorthand. Also, if divergent or convergent associations are involved, a small amount of learning in one direction may impede learning in the opposite direction.

IMPLICATIONS FOR INSTRUCTIONAL MATERIALS

As implied in the foregoing discussion, the chief factor determining ease of early learning is the variability of the stimuli and responses of the task. As suggested, the less the variability, the faster the learning. Accordingly, one way to speed progress (and to enhance motivation through an accumulation of successes) is to minimize the variations in the early learning materials. Unfortunately, variations in materials are sometimes an inherent characteristic of the skill; for example, those involving language – shorthand and typing. The problem becomes one of scheduling or "programming" the materials so as to minimize change from trial to trial. For example, in typing only one letter might change from one word to the next, as in the series: fit, fin, sin, son. In early shorthand learning the series: *seen, seem, same, sane* is illustrative. At the other extreme, all the letters (or shorthand strokes) might change from one word or one trial to the next. Other things being equal, however, the principle of speeding the learning through minimum change has been studied and found useful by Detambel and Stolurow (1956) and by Stolurow (1956) with different tasks. The principle suggests that a modicum of variation in materials, not a lot, will facilitate early learning.

Other things are rarely equal, however, and although variability is known to retard *learning*, it increases *transfer* to later performance. The applicable principle is this: when a task requires varied responses, maximum transfer to ultimate task performance results from the early introduction and continuous use of these varied responses (Wolffe, 1951). This principle would suggest the early intro-

duction of a wide ranging vocabulary, especially in typing training in which the preponderance of letter-level responses up through at least 40-60 word per minute stages tends to make word length an immaterial consideration. In any event, the problem in designing instructional materials is one of balancing off the benefits accruing from minimum change in early stages with the poorer transfer to later performance which results from such a practice. The relative merits of the two possibilities for instructional materials probably depend in large part on *when* in the learning of a skill greater variability is introduced. The problem is an empirical one and eminently worth experimental investigation.

One additional consideration, exceptionally prominent in typewriting learning and present only to a lesser degree in shorthand learning, is one of confusability. By far, the largest class of typing errors is substitution errors, mainly the striking of a key adjacent to the desired one. The stroke for *r*, for example, is only a slightly different from the stroke for *t;* and the problem throughout learning is one of *response differentiation.* Similarly, with Gregg shorthand *f* is confused with *p*, *r* with *k*, small circle vowels with large ones; in Pitman shorthand *pl* is written for *pr*, *n* hooks are confused with *f* hooks. In view of the enormous number of letter and sound combinations in the language, it is important to give the learner practice right from the start in making these differentiations. Using typing copy loaded wth *r*'s and *t*'s (e.g., Try to write at the right rate.), with *m*'s and *n*'s (e.g., We maintain a nominal account in your name.), and similarly for other commonly substituted letters. Perhaps, directly after introductory work under minimum-change conditions, very heavy doses of response differentiation practice might be introduced.

CONDITIONS OF PRACTICE

It already has been pointed out that we learn not only to make correct responses in the presence of particular cues, but also that we learn to eliminate making incorrect responses. The particular responses which are most efficient for the performance of skill because of previous learning, are often associated with other responses that are not needed in the new situation. Sometimes these associated responses have a negative relationship to the learning of the new skill. Also, aspects of the new stimulus situation that may have been critical to the performances of an earlier learned skill might be less important, unimportant, or even misleading in the learning of the new skill. Similarly, the mediation processes, which are to aid in

connecting a cue with a response, actually may be neutral, ambiguous, or even interfering rather than supportive of the new skill.

From this very brief analysis we can see that practice provides an opportunity for either the direct use of an existing habit previously learned or the *realignment* of the cue, mediation, or response processes. An example of the situation requiring realignment is that in which inappropriate or awkward movements appear in the initial stages of learning a new skill. Another is the failure to identify the critical cue.

FIDELITY

To the maximum extent possible, practice should be conducted under conditions like those attending the actual use of the skill. This does not mean that it always will be most efficient to start the learner in the actual situation in which he will be required to perform the skill to be learned. It may be necessary to build up skill components into larger and larger assemblies that eventually permit the learner to perform correctly in the criterion situation.

The complexity of a task in relation to the student's ability is the determining factor. Whether the teacher starts the learner on a component skill and then combines these, or whether the teacher has the learner start directly on the task to be learned, depends upon the complexity of the task. In teaching typewriting West (1956) found that for young adult learners it was more efficient to begin with meaningful material than with finger drills or nonsense material — individual stroking responses. Most people who are learning to type already have mastered reading skills, have established mediation processes, and can make the required finger movements. They transfer these rather readily to the typing of meaningful materials. In fact, West found that in doing so they perform better than individuals who were trained to typewrite by beginning with finger drills and nonsense material.

ACCURACY VERSUS SPEED

In summarizing the experimental evidence, West (1957) is correct in his emphasis on speed during the keyboard-learning stage in spite of its *apparent* contradiction with logic. The paradox in typing comes from the fact that when teachers emphasize accuracy, they encourage the student to use a *different* response, a response which has to be eliminated when greater speed is sought. The appropriate principle regarding accuracy and speed is that practice from the start should promote accuracy *of the responses required at higher levels of skill.* Once the desired rapid response is being made, then additional speed increases can be stressed. A beginning typist should

make only ballistic motions. These are the responses. A beginning typist who uses a slow, cautious movement rather than a ballistic movement is learning to perform a different skill from that which will be demanded when moved to a more advanced stage. The criterion of accuracy should not be just hitting a particular key, but rather *hitting a particular key in a specific way.* To some extent, increases in speed will come about naturally both as a consequence of the elimination of irrelevant responses and as a result of shortening of the interval between cue and response.

OVERT GUIDANCE

Skills are often taught through the use of guidance. Research findings indicate the following four points about guidance: (1) guidance can aid provided it is not overdone; (2) guidance becomes less effective with continued use – as the point at which it is introduced becomes increasingly distant from the beginning of practice, (3) guidance is most effective when relatively small amounts are used early in learning; and (4) guidance cannot produce the high level of performance achieved by independent practice.

STAGES OF SKILL DEVELOPMENT

It is possible to conceive of three separate phases in the learning of the skill. In the earliest phase the individual is eliminating unnecessary responses (unnecessary baggage, so to speak) that interfere with accuracy. The second stage arises gradually as a continuation of the first. In it the learner is accurate according to objective standards, but his responses are unnecessarily complicated and more effortful than they need to be. The third stage gradually emerges from the second. In it the learner is crowding together the necessary and sufficient responses – increasing his speed. The extent to which this compression develops is determined by: (1) conditions of practice – pacing; (2) the criteria used to evaluate performance – standards of correctness; and (3) the learner's capability.

TRANSFER AND INTERFERENCE

A practical condition affecting the efficiency of learning a new skill is the way in which the learner spends his time between practice sessions. Some activities will interfere with the new learning whereas others will not. Only one activity – sleep – has a minimum adverse effect on the retention of practically every skill. All other

activities relate either positively or negatively to the skill that is being learned, and this relationship may be either appreciable or insignificant.

One way to summarize generally the results of research on *interference* between tasks is as follows. We forget very little during sleep. When awake, we may forget a lot, very little, or remember even more than we did immediately after our last opportunity to practice. Which of these will occur depends upon what the learner does between practice sessions.

A specific analysis will be helpful at this point. It is useful, if not necessary, to employ the distinctions previously made among the three features of a skill – cue, response, and associative connections (mediators). The two tasks referred to are the task practiced and the one interpolated between practice sessions. Interference is *less* if during the interpolated period the same responses are practiced in association with similar, rather than different, cues. On the other hand, if the same cues, or very similar ones, also appear in the interpolated task and if the learner practices *different* responses to them in this second situation, the amount of interference is likely to be great, e.g., the shorthand student who takes notes in longhand in other classes. Under such circumstances shorthand will be less rapidly learned.

Some summary statements can be made about the transfer effects that obtain from one task to another. Little or no transfer arises when: (1) tasks do not share cues, responses, or mediators, e.g., arithmetic and typing, or (2) when tasks share mediators but not cues or responses, as in shorthand and typing. There will be some positive transfer when tasks share responses but not cues, as in typing from dictations versus typing from printed copy. When tasks share cues but not responses, negative transfer or interference results, the extent depending on the degree of response similarity. Thus, considerable interference would arise in learning two different shorthand systems. Supplanting a pressing motion with a ballistic one on the typewriter is not easy; nor are the motions on a manual and on an electric typewriter identical.

Consider, too, that tasks may differ in content (typing a list of names versus a list of numbers), in operations (typing versus writing a list of names), and that, depending on the tasks, there might be transfer for content but interference for operations (or vice versa).

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The Executive Secretary and Her Leadership Role

(From a speech given by Dr. Mary Virginia Moore, Educational Consultant for the National Secretaries Association (International) at a Management Institute workshop for executive secretaries, University of Wisconsin, May 12, 1959)

A new and refreshing concept of what a secretary, especially an executive secretary, can and should do is being expressed by management representatives. Executives are talking about the significance of the secretary's role in such matters as human relations and decision making, and they either assume or minimize such basic skills as typewriting, shorthand, and filing. All who are concerned with the secretarial profession, and secretaries in particular, welcome this concept because it calls attention to the fact that secretaries are capable of doing more than stenographic duties and because it provides an opportunity for the interested and qualified to use their training, experience, and abilities as they move toward professional status.

Competence in the basic skills still represents the best insurance for secretarial advancement, as well as a prerequisite for obtaining most jobs, but the emphasis has changed. In the past, we emphasized the basic skills; now we emphasize the "extras" beyond stenographic routine when we identify the executive, professional secretary. Describing his secretary, Vice President Nixon said, "She has to have the skill of making hundreds of decisions a day for her employer — and she has to know just what decisions not to make as well . . . she is the balance wheel for the whole office."

Recently a multimillionaire donated funds for a university building in memory of his wife. The donor was invited but could not accept an invitation to be present at a meeting to decide on a building location. He sent his secretary. The perturbed university president called the multimillionaire to explain the significance of the meeting. The multimillionaire made it clear that his secretary would act for him in making location decisions.

The extras which move a secretarial job into the professional classification ordinarily receive no publicity, and they vary from job to job. Certainly I would not imply that in order to be a professional secretary one must decide where to locate memorial buildings for beloved and departed wives of employers or that one must perform any single list of activities. What seems most obvious is that the extras include skill in decision making and human relations and the guidance and direction implied in fine leadership.

(EDITOR'S NOTE: *These comments on the role of the secretary are indeed refreshing. Yet, their real significance lies in the demands that the concept makes on the business educator. Does the education of a top-level secretary begin in high school or after high school? What should be the relationship of the business teacher to the educational program of the National Secretaries Association?*)

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